

# Wednesday 07 October 2020 - Morning

# **AS Level Computer Science**

H046/01 Computing Principles

<b>Time</b>	allowed:	1	hour	15	minutes	

 Do not use:	
a calculator	
a odiodiator	



Please write clearly in black ink. Do not write in the barcodes.								
Centre number					Candidate number			
First name(s)								
Last name								

#### **INSTRUCTIONS**

- Use black ink.
- Write your answer to each question in the space provided. You can use extra paper if you need to, but you must clearly show your candidate number, the centre number and the question numbers.
- · Answer all the questions.

#### **INFORMATION**

- The total mark for this paper is 70.
- The marks for each question are shown in brackets [ ].
- Quality of extended response will be assessed in questions marked with an asterisk (\*).
- This document has 16 pages.

#### **ADVICE**

· Read each question carefully before you start your answer.



## Answer all the questions.

1		ompany produces CPUs for desktop and laptop computers. Each CPU is designed around the Neumann Architecture.
	(a)	Describe what is meant by the term 'Von Neumann Architecture'.
		[2]
	(b)	A CPU will repeatedly run the Fetch-Decode-Execute-cycle shown in <b>Fig. 1</b> .
		C Fetch A
		Execute Decode
		B
		Fig. 1
		(i) Describe what happens during the 'Fetch' stage shown in Fig. 1.
		You should refer to the use of specific registers in your answer.

.....[4]

	(11)	interrupt.
		Tick <b>one</b> box to indicate where in <b>Fig. 1</b> an interrupt would be handled.
		A
		В
		c
		[1]
hom		a university student. She is considering buying a laptop to help with her studies both at d university. Her friend has told her she will need to choose an operating system to run on up.
(a)	Two	functions of an operating system are memory management and scheduling.
	Stat	e <b>two</b> other functions of an operating system.
	1	
	2	
		[2]
(b)		operating system Julie is considering makes use of paging to manage the laptop's nory.
	Ехр	lain <b>one</b> benefit of using paging for this purpose.
		[2]

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(c)	technology rather than a magnetic hard drive.
	Explain <b>two</b> reasons why Julie would use flash technology to store her files.
	1
	2
	[4
(d)	State the name of <b>one</b> utility that Julie could install on her laptop.

3\* OCR Car Park would like to calculate the parking charges when a car leaves their car park.

They will need to record the time that a car enters and leaves their car park in order to calculate the parking charge.

Discuss the different methods that could be used to collect this data.

In your answer you should include:  The benefits and drawbacks of each method  Ethical implications  Legal implications

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Shreya is a web developer who creates webpages for a variety of different companies.

(a)	Pho	otographs on a webpage are usually compressed.
	(i)	State which method of compression is most likely to be used for this purpose.
		[1]
	(ii)	Explain the need to compress photographs in this situation.
		[2]
(b)		rder to view a website, a user enters a website address into their web browser such as ://www.ocr.org.uk. The website will then be displayed onto the user's screen.
	Ехр	lain how the Domain Name System (DNS) plays a role in websites being loaded.
		[4]

4

(c) Shreya has received a webpage written in HTML shown in Fig. 2.1.

Fig. 2.1

Some of the formatting requirements for this webpage are shown in Fig. 2.2.

		Formatting R	Requirements
Class/ID	Text	font-family	colour
Beeb	History of the BBC Micro Computer	times	green
model	Model A Model B	arial	red

Fig. 2.2

	Shreya ated in <b>F</b>	to	display	the	webpage	so	that	it	meets	the	formatting
 	 	 						••••			
 	 	 			•						

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		[6]

5

(a)	Convert the binary number 11101100 into a denary number.
	[1]
(b)	Convert the binary number 10110011 into a hexadecimal number.
	[1]
(c)	Convert the two's complement binary number 10011011 into a denary number.
	[1]
(d)	Calculate the subtraction of the following two 8-bit binary numbers.
	You must show your working.
	11010011
	01111001 -

[2]

(b)	Fig.	. <b>3</b> shows ass	sembly code							[1]
				jump X Y Z	LDA STA HLT LDA STA HLT DAT DAT	Y jump X Z Y Z 0 5				
	(i)	Tick <b>one</b> bo	v to indicate	e the progr	Fig. 3	construc	t that is i	not user	Lin <b>Fig. 3</b>	
	(')	Sequence Selection		s the progr	amming	CONSTITUTE	t triat is i	iot asce	1 ig. 0	•
		Iteration								[1]
	(ii)	When the pr	rogram is ru	ın, 7 is inp	ut by the	user.				
		State the va	llue that will	be in the	memory	location	z when t	he progi	am has r	un with this
										[1]

	(111)	programming language.	ЭI
		You should write your code using pseudocode or program code.	
			••
(c)		Js can be designed to take a Complex Instruction Set Computer (CISC) or a Reduce ruction Set Computer (RISC) approach.	
	Des	cribe <b>one</b> difference between CISC and RISC.	
		[2	2]

7 Daniel is an engineer. He has created the following logic circuit shown in Fig. 4.

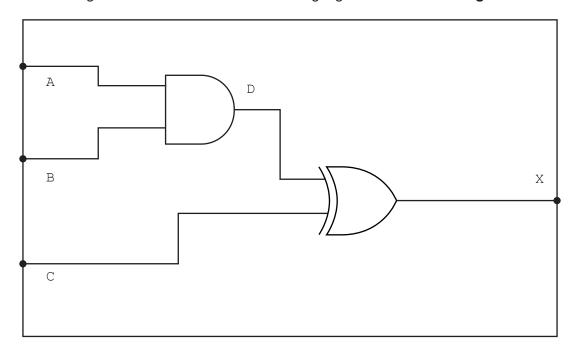


Fig. 4

Complete the truth table below for the logic circuit shown in Fig. 4.

Α	В	С	D	x
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		

8 Albert runs a competition each week in his local village hall. So that Albert can contact the winner he would like a program for the winner to enter their telephone number which is then checked and written into a text file.

The rules for Albert's program are as follows:

- 1. The telephone number is entered. This is checked to ensure that the first digit is a 0
- 2. If the first digit is not a 0 then a message saying "Needs To Start With 0" is printed
- 3. If the first digit is a 0 then the telephone number is passed into a pre-existing function called checkLength as a parameter. This will return true if the length of the telephone number is long enough
- 4. If the telephone number is long enough then it is written into a text file called "winner.txt"
- 5. If the telephone number is not long enough then a message saying "Not Long Enough" is printed.

Complete the procedure competitionWinner so that it meets the rules of Albert's program.

You should write your procedure using pseudocode or program code.

<pre>procedure competitionWinner()</pre>

endprocedure

**9\*** A company has six solicitors working in two offices in different locations. They work with the general public and help them solve any sensitive legal issues they may be facing.

The solicitors would like to set up a computer network to allow them to work together more effectively.

Discuss the benefits and drawbacks of computer networking to the company.

You should	refer to	the following	ın vour	answer:

- Different networking methods
- Cost implicationsSecurity implications

County implications

		[9]

## **END OF QUESTION PAPER**

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